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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/817,120	03/27/2001	Kevin K. Chan	YOR920000231US1	8952

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EXAMINER

ROCCEGANI, RENZO

ART UNIT PAPER NUMBER

2825

DATE MAILED: 12/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
09/817,120	CHAN ET AL.
Examiner	Art Unit
Renzo N. Rocchegiani	2825 <i>h</i>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 22-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim recites forming a back-gate on a substrate, forming a passivation layer on the back-gate and then forming a gluing layer on the passivation layer but that the gluing layer is between the back-gate and the substrate. "Said substrate" in line 6, refers to the first substrate which makes the claim indefinite because if the back-gate is on the substrate and the passivation is on the back-gate then the gluing layer cannot be between the back-gate and the first substrate. Please make appropriate correction.

4. Claims 2 and 17 recite the limitation "said intermediate layer". There is insufficient antecedent basis for this limitation in the claim. Claim 1, calls it "intermediate gluing layer" thus it should be referred to as that in all the claims.

5. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 4 recites "plasma vapor deposition (PVD)", this is

incorrect because both in the specification of the present application (See page 5) as well as in the specific art generally, PVD stands for "physical vapor deposition" not "plasma vapor deposition". Please make the appropriate correction.

6. Claim 12 recites the limitation "said substrate with a multilayer stack". There is insufficient antecedent basis for this limitation in the claim. Nowhere in the preceding claims there is mention of a "multiplayer stack" on the substrate. Please make appropriate correction.

Claim Objections

7. Claim 5 is objected to because of the following informalities: the wording of this claim is awkward. First the applicant uses the full word "minutes" and the abbreviation "min." at the same time, please choose one. Second, the claim recites "forming a monolayer of W-Si silicide at 625 degree C for 1.5 min. reaction with . . . " the phrase "reaction with" is awkward. It is suggested to replace the words "reaction with" with "using". Appropriate correction is required.

Specification

8. The disclosure is objected to because of the following informalities: on page 7, line 20, there is a blank space that should be filled with an application number.

Appropriate correction is required.

9. A substitute specification including the claims is required pursuant to 37 CFR 1.125(a) because the top margin of the pages are too small for the holes of the folder. The holes punched through the words and rendered the first line of every page illegible.

A substitute specification filed under 37 CFR 1.125(a) must only contain subject

matter from the original specification and any previously entered amendment under 37 CFR 1.121. If the substitute specification contains additional subject matter not of record, the substitute specification must be filed under 37 CFR 1.125(b) and must be accompanied by: 1) a statement that the substitute specification contains no new matter; and 2) a marked-up copy showing the amendments to be made via the substitute specification relative to the specification at the time the substitute specification is filed.

Drawings

10. The drawings are objected to under 37 CFR 1.83(a) because they fail to show item 305 as described in the specification page 6, line 3. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1-4, 7-8, 12, and 14-18 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,387,555 (Linn et al.).

Linn et al. discloses forming a bended wafer with a metal back-gate, a

passivation layer on the metal back-gate and an intermediate gluing layer on the passivation layer. (Fig. 5a-b) The intermediate gluing layer comprises a silicon layer. (col. 6, lines 50-52). The formation of the metal back-gate comprises the deposition of W and the passivation layer is a W layer. (Fig. 5a-b). The W is deposited by sputtering, i.e. a PVD process. (col. 6, lines 56-59). The structure is annealed at 900 degree C. (col. 7, lines 5-15).

Because the structure is heated, it is inherent that it will undergo a temperature ramp annealing process.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,387,555 (Linn et al.) in view of U.S. Patent No. 6,049,114 (Maiti et al.)

As stated in paragraph 12, all the limitations of the claim have been met except for disclosing that the W may be deposited by CVD.

Maiti et al. teaches that CVD is interchangeable with PVD to deposit W. (col. 3, lines 10-15)

It would have been obvious to one having ordinary skill in the specific art to deposit W via CVD, since Maiti et al. teach that this process is interchangeable with PVD.

15. Claims 9-10, and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,387,555 (Linn et al.) in view of U.S. Patent No. 6,057,212 (Chan et al.).

As stated in paragraph 12, all the limitations of the claims have been met except for specifying that the substrate comprises an SOI with an oxide formed thereon.

Chan et al. teaches the bonding of substrates using W, wherein the substrate is an SOI substrate with an oxide grown thereon. (Fig. 6).

It would have been obvious to one having ordinary skill in the art to combine the teachings of Chan et al. to the invention by Linn et al., since Linn et al. disclosed a silicon substrate and Chan et al. teaches a possible substrate, i.e. an SOI with a silicon oxide thereon, and since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Allowable Subject Matter

16. Claims 6, 11 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Further, as allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

17. The following is an examiner's statement of reasons for allowance: the prior art does not teach or suggest a process to form a device with a metal back-gate with a

passivation layer and an intermediate gluing layer thereon, wherein the W is deposited conductive an UHV desorption of native oxide under a pressure of 10^{-9} torr, at 750 degree C for 5 minutes, forming a monolayer of W-Si at 625 degree C for 1.5 minutes using silane to react with the bare W and performing a nitridation of the W-Si using ammonia to form W-Si-N at 750 degree C for 30 minutes, and wherein an LTO is deposited over the W layer.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Renzo Rocchegiani whose telephone number is (703) 308-5839. The examiner can normally be reached on Monday through Friday from 8:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached at (703) 308-1323. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9318.

RNR

November 27, 2002



Matthew Smith
Supervisor